

## FINDING OF NO SIGNIFICANT IMPACT (FONSI)

### ENVIRONMENTAL ASSESSMENT FOR MINUTEMAN III MODIFICATION

**Agency:** United States Air Force (USAF)

**Background:** Pursuant to the provisions of the National Environmental Policy Act (NEPA) of 1969, Executive Order 12114, Council on Environmental Quality (CEQ) Regulations [40 Code of Federal Regulations (CFR) Parts 1500-1508], 32 CFR Part 989, and the US Army Kwajalein Atoll Environmental Standards (UES), the USAF has conducted an assessment of the potential environmental consequences of the testing and deployment activities associated with proposed modifications to the Minuteman (MM) III Intercontinental Ballistic Missile (ICBM) system. The assessment focused on those activities that have the potential to change the human and natural environments.

The United States has historically relied on the concept of deterrence to maintain peace. Because the MM III will become the only land-based ICBM system in America's nuclear arsenal, the Department of Defense (DOD) is extending the life of the existing force of MM III ICBMs through the year 2020. As a life-extension action, the proposed modifications involve reconfiguration of the MM III missile Reentry System (RS) to be capable of carrying the Mark 21 reentry vehicle (RV) and warhead—currently deployed on Peacekeeper ICBM missiles undergoing deactivation—as well as the existing Mark 12A RV. The newer and more capable Mark 21 RVs will replace the older Mark 12 RVs now deployed on MM IIIs, thus enhancing nuclear safety and improving the future reliability of the weapon system. The proposed modifications will require testing and deployment of system hardware/software, equipment, and trainers needed to incorporate Mark 21 RVs onto missiles at any of the MM Launch Facilities (LFs) located within the three MM Wings (FE Warren AFB, Wyoming; Malmstrom AFB, Montana; and Minot AFB, North Dakota).

In conjunction with the RS modification and deployment of Mark 21 RVs, upgrade and replacement of electronic command and control console equipment, and software, is also needed at all Launch Control Centers (LCCs) located within the three MM Wings, and at other USAF and contractor trainer/test facilities supporting MM III ICBM operations. The planned console equipment upgrades are needed to resolve a variety of software deficiencies and aging hardware failures. The upgrades will also implement changes to the console operations software required for deployment of the Mark 21 RVs. All of the proposed MM III modifications are needed for continued nuclear deterrence and improved safety and reliability of the weapon system, and to compensate for the deactivation of Peacekeeper missiles.

The Environmental Assessment (EA) considers all potential impacts of the Proposed Action and the No Action Alternative. This Finding of No Significant Impact (FONSI) summarizes the results of the evaluations of the proposed activities associated with the proposed MM III modification.

**Proposed Action and No Action Alternative:** The EA assesses the environmental impacts of the proposed testing and deployment activities associated with the proposed MM III modification. During the test and evaluation phase, MM III missile flight tests, utilizing the modified RS, will originate from Vandenberg AFB, California. The MM boosters used in the flight tests will be pulled from operational LFs randomly selected at the Wings. The LFs will then receive replacement boosters provided by the rocket motor depot maintenance facility at Hill AFB, Utah.

At Vandenberg AFB, the missile launches will occur from existing silos that are regularly used for these types of tests. On each test missile, the operational RVs are replaced with one to three RV simulators. At the terminal end of each missile flight, the test RVs will impact near the US Army Kwajalein Atoll (USAKA) in the Republic of the Marshall Islands (RMI). Test RVs containing high explosives would be detonated at some altitude (airburst), or upon impact on land or water. RVs that do not contain high explosives will remain intact as they impact land or water at high velocities. In addition to the ongoing three to four MM III Force Development Evaluation flight tests conducted every year, two additional flight tests per year will occur in Fiscal Years 2005 and 2006.

During the deployment phase for RS modifications at the Wings, efforts will include the distribution of new and modified hardware for mounting the Mark 21 RVs onto MM IIIs, new electronic flight equipment, changes to command and launch equipment, new support equipment, new and modified software, and modifications to personnel training hardware. RS-related test and support equipment at both Hill and Vandenberg AFBs will also be modified accordingly. Deployment of the RS modification kits and Mark 21 RVs at the three MM Wings will begin in 2006 and continue through 2011.

For the new command and control console equipment, deployment activities will involve the replacement of older console equipment (including Visual Display Units and computer Head Disk Assemblies), and related software upgrades, at all operational LCCs located within the three MM Wings, and at various trainer and support facilities located at each Wing support base, Hill AFB, Vandenberg AFB, and at other USAF/contractor support locations. Deployment at all trainer units will be completed prior to fielded deployment in 2006. Deployment of the remaining equipment at operational facilities will occur as part of routine maintenance, or by force deployment over a 3-year period beginning at the end of 2005 or 2006. In most cases, the old console equipment will be declassified and turned over to the local or regional Defense Reutilization and Marketing Office for resale, material recycling, and/or disposal as solid or hazardous waste.

Under the No Action Alternative, the USAF would not proceed with the proposed MM III modification. However, ongoing system monitoring and testing of MM III components and subsystems (including annual missile flight tests) would continue at all locations where such operations are currently conducted. By not implementing the proposed modifications, the nuclear safety and future reliability of the MM III weapon system would not be enhanced. Eventually, the No Action Alternative would require some missiles to be removed from the operational force, thus reducing the overall mission readiness of the MM III ICBM system and jeopardizing national security.

Though other possible alternatives to the Proposed Action were considered—including computer simulations and alternative test locations—all were deemed unreasonable and eliminated from further analysis.

**Environmental Effects:** Potential environmental effects associated with the Proposed Action and No Action Alternatives were assessed for the following environmental resources: air quality, noise, biological resources, cultural resources, health and safety, and hazardous materials and waste management. Other resource areas—including hydrology and groundwater, utilities, solid waste management, land use, socioeconomics, environmental justice, soil resources, and visual and aesthetic resources—were not analyzed further because no significant impacts to these resources are anticipated as a result of implementing the Proposed Action. Potential effects on the environment from implementation of the Proposed Action are described in the following paragraphs.

- **Air Quality.** For missile flight tests at Vandenberg AFB, rocket motor exhaust emissions will be released into the lower atmosphere. Because the launches are infrequent, short-term events, emissions products will be rapidly diluted and dispersed by prevailing winds. No violation of air

quality standards or health-based standards for non-criteria pollutants is anticipated. No changes to existing or new air emission permits are required. Also, a review of the General Conformity Rule resulted in a finding of presumed conformity with the State Implementation Plan. From a global perspective, the exhaust emissions released from the MM III motors into the upper atmosphere will add to the overall global loading of chlorine and other gases that contribute to long-term ozone depletion. However, when compared to the amount of emissions released on a global basis, the flight tests will not be statistically significant in contributing to cumulative impacts on the stratospheric ozone layer. Overall, no significant impacts to air quality will occur.

- **Noise.** Each MM III flight test launch will generate noise levels ranging from 125 decibels (dB) (unweighted) in the immediate vicinity of the launch site at Vandenberg AFB, to around 105 dB (unweighted) or lower in some populated areas off base. While these noise exposure levels can be characterized as very loud, they will occur infrequently, are very short in duration (about 20 seconds per launch), and will have little effect on the Community Noise Equivalent Level off base. Sonic booms generated by the MM III missile will typically start reaching the surface some 25 nautical miles downrange of the launch site, and thus will not affect coastal land areas. Consequently, no significant impacts to the noise environment will occur.
- **Biological Resources.** For biological resources at Vandenberg AFB, some disturbances to marine mammals and migratory birds from missile launches and helicopter overflights are expected. However, a National Marine Fisheries Service (NMFS) incidental “take” permit is in place that authorizes incidental harassment of pinnipeds. Helicopter overflights are required to maintain minimal distances away from protected seal haul-outs/rookeries and bird roosting/nesting areas. On-base monitoring before and after launches has shown no long-term effects on seals, or seabirds and shorebirds. Other studies at the base have shown no concerns for long-term acidification of surface waters as a result of launch emissions. Some temporary distress to vegetation near launch sites can be expected. Though the probability for an aborted MM III launch to occur is extremely low, the dispersion of unburned propellant in such cases is not expected to cause concern for perchlorate build-up in local waters. Base actions would immediately be taken to recover and cleanup unburned propellant and any other hazardous materials that had fallen on the beach or in shallow waters. Any liquid or solid propellant falling into the offshore waters would be subject to continual mixing and dilution due to the ocean waves and currents, and hence, local accumulation of perchlorates from the propellants would not be significant.

For the over-ocean launch corridor, sonic boom overpressures from MM III launch vehicles could be audible to protected marine species underwater. Underwater pressure waves generated by the sonic booms are expected to be less than 140 dB, which is well below the lower limit (178 dB) for inducing behavioral reactions, and the lower limit (218 dB) for inducing temporary threshold shift (TTS) in marine mammals and sea turtles, all sound pressure levels being referenced to 1 micro Pascal ( $\mu\text{Pa}$ ). Because the resulting pressures will be relatively low, and very short in duration, no long-term adverse effects are anticipated. For marine animals, the potential also exists for direct contact or exposure to underwater shock/sound waves from the splashdown of spent rocket motors. However, in the open ocean, the probability of impacting protected marine mammals and sea turtles is insignificant based on statistical analyses. The MM III flight tests will occur only 3 to 4 times per year, and motor impacts from each flight will likely not occur at the exact same locations. Though residual amounts of battery electrolytes, hydraulic fluid, propellants, and other materials in the spent rocket motors could lead to the contamination of seawater, the risk of marine life coming in contact with, or ingesting, toxic levels of solutions is unlikely, considering the rapid dilution of any contaminants and the rapid sinking of any contaminated components to the ocean floor.

At USAKA, target sites for test RVs are located in the deep ocean area east of the Kwajalein reef or in the vicinity of Illeginni Island. Though migratory seabirds and shorebirds near RV impact areas can be expected to exhibit brief flight responses to sonic boom overpressures, local populations do not appear to have been adversely affected by years of testing. The sonic booms could also affect hearing in marine mammals and sea turtles underwater. However, at 117 to 176 dB (referenced to 1  $\mu$ Pa), the resulting underwater pressures will fall just below the lower limit for inducing behavioral reactions (178 dB referenced to 1  $\mu$ Pa), and well below the lower limit for inducing TTS (218 dB referenced to 1  $\mu$ Pa) in such animals. Because the resulting pressures will be relatively low, and very short in duration, no long-term adverse effects are anticipated. Like the spent MM III rocket motors, an RV impacting in the ocean or Kwajalein Atoll lagoon will result in underwater shock/sound waves, but with much higher pressure-levels being generated. At distances within a few thousand yards of an RV impact point, underwater pressure levels could induce behavioral reactions (e.g., abrupt movements, changes in surfacing, and sudden dives) in marine mammals, and possibly sea turtles. If they occur, such reactions would last for a very brief period and not result in any long-term effects. At a distance of 128 feet (ft) [39 meters (m)] from the RV splashdown site, TTS could begin to occur; and within several feet of the impact point, the pressure levels could prove fatal to these animals. However, the number of groups (small pods or schools) of these animals to be struck or exposed to harmful underwater shock/sound waves is estimated to be no higher than 0.000003 to 0.000009 per RV test event, depending on the number of RV simulators carried on the launch vehicle. The risk of physically injuring or killing the animals is extremely low in view of the facts that: (1) only 3 to 4 MM III launches will be conducted every year, (2) RV target locations are not always the same, and (3) the probability of impact on marine mammals and sea turtles caused by underwater shock/sound waves is insignificant.

Target areas for RVs will be selected to minimize impacts to protected reefs and identified wildlife habitats. When an RV impacts directly on Illeginni Island or in the shallow coral reefs of Kwajalein Atoll, a crater will form. Post-test debris recovery and cleanup operations on Illeginni Island will also cause some short-term disturbance. Such impacts could potentially result in the loss of some protected migratory birds, mollusks, sponges, corals, and other marine life; and damage small areas of migratory bird habitat, sea turtle nesting habitat, and coral reef habitat. The USAF has projected that approximately four to five RVs will impact at Illeginni over the next 20 years. The overall effects of these impacts are considered to be minimal.

Following an RV airburst or impact of an RV in the ocean, the Kwajalein Atoll lagoon, and/or on Illeginni Island, the resulting debris would disseminate any on-board hazardous materials—such as beryllium (Be) and depleted uranium (DU)—around the impact point and some distance downwind. However, the contaminants released by some RVs are extremely insoluble, and the dilution and mixing of the ocean and lagoon are so great that the concentration in water would be no different than natural background levels. Short-term exposures to birds or other wildlife is unlikely to result in significant accumulations, particularly when considering the small amount of unrecovered material that may persist in the environment. Thus, RV contaminants do not present a major hazard to terrestrial and marine life.

In the biological opinion regarding effects on nesting habitat for green sea turtles (*Chelonia mydas*) at Illeginni Island (Appendix D in the EA), the US Fish and Wildlife Service (USFWS) determined that the Proposed Action (along with reasonable and prudent measures, and conservation measures) is not likely to jeopardize the continued existence of the species. No critical habitat has been designated for this species; therefore, none will be affected. An Incidental Take statement—for the loss of no more than three green sea turtle nests, or injury or loss of up to 300 hatchlings, per year as a result of project-related RV impacts in the vicinity of Illeginni Island—is included in the biological opinion.

Though such losses are not likely to occur, it is expected that they would be offset by the implementation of conservation measures identified in the biological opinion.

Overall, no significant impacts to biological resources will occur at any of the locations affected. The implementation of mitigation measures identified in the EA will help minimize or eliminate potentially adverse impacts that might occur.

Because of the potential for adverse impacts on biological resources at USAKA, the proposed RV flight test activities will also require a Document of Environmental Protection (DEP) in accordance with the UES. Separate from the NEPA process under which the EA is being prepared, the DEP process serves to provide a structured forum for USAKA, US Government agencies, the RMI Environmental Protection Authority (RMIEPA), and the general public to review and comment on proposed US activities that have the potential to affect the USAKA environment.

- ***Cultural Resources.*** Given the extremely limited potential for any remaining traditional/prehistoric remains on Illeginni Island, the likelihood of impacts to any resources must be considered either non-existent or extremely low. Though several buildings on the island are of the Cold War era, they currently do not meet RMI criteria for historic significance. Additionally, there is a low probability for the buildings to be impacted by RV tests. As a result, little or no impacts to cultural resources are expected.
- ***Health and Safety.*** All program activities will be accomplished in accordance with applicable DOD, Federal, state, and foreign health and safety standards. Regarding rocket motor transportation over public roads, accident rates for ICBM-related operations have historically been very low. For flight tests from Vandenberg AFB, range safety officials will evacuate the launch hazard area and issue Notices to Airmen, as well as to Mariners, and the missile hazard zones will be determined clear of both aircraft and surface vessels before proceeding with any flight test. At USAKA, the RV flight tests will require that the Mid-Atoll Corridor Impact Area be cleared of aircraft and vessels in a similar manner. Non-essential personnel are evacuated from the RV impact area, while remaining personnel are placed in protective shelters.

As previously mentioned, some RV tests at USAKA will release hazardous and toxic materials around the impact area. For a land impact on Illeginni Island, such debris will occur close to the point of impact, mostly within a 328-ft (100-m) radius. As a result, the major potential health concern of these tests is the subsequent effects on workers visiting the island, in support of long-term management and restoration of the island. However, modeling and post-test sampling results from prior RV flight tests have shown that air sampling levels for Be and DU contaminants are far below Federal guidelines, and similar to pre-test background levels. Various post-test safety and health procedures already in place will be followed. These procedures include securing the impact area from inadvertent traffic, and the protection of on-site workers from respiratory exposure during post-test cleanup operations. These and other mitigation measures listed in Section 4.7 of the EA will be applied to all RV tests at USAKA.

By adhering to established safety standards and procedures, the level of risk to military personnel, contractors, and the general public will be minimal at all of the locations affected. Thus, no significant impacts to either occupational or public health and safety are expected to occur.

- ***Hazardous Materials and Waste Management.*** For hazardous materials and waste management, activities at each affected installation are governed by specific environmental regulations, and existing pollution prevention and facility response plans, that minimize any potential environmental consequences resulting from the use and handling of these materials. Each installation has a plan in

place that provides guidelines and instructions to prevent and control accidental spills of hazardous materials, including a description of appropriate countermeasures to contain, clean up, and mitigate the effects of a spill or discharge. Appropriate permits are in place and workers are trained to follow procedures for the proper storage, transportation, and disposal of hazardous waste. Hazardous material and waste handling capacities will not be exceeded, and management programs will not have to change.

In regards to the release of hazardous and toxic materials from RV tests at Illeginni Island, any residual fragments of RVs will be recovered from land or shallow water areas and properly disposed of in accordance with the UES and all applicable US regulations. As previous sampling results have shown, levels of Be and DU contaminants in the air at Illeginni Island continue to remain at or near background levels, even after years of testing. Be and DU soil concentrations on the island can exceed background levels in the vicinity of RV impact sites. However, the Be and DU concentrations in the dissolved form are below background levels. In addition, the rates of dilution for Be and DU are significantly greater than their rates of dissolution in water, ensuring that the concentrations would not exceed background levels.

Consequently, no significant impacts from the management of hazardous materials and waste will occur at any of the sites affected.

**Monitoring and Mitigation:** Within the EA, various management controls and engineering systems for all locations affected are described. Required by Federal, state, DOD, and Service-specific environmental and safety regulations, and international agreements, these measures are implemented through normal operating procedures.

In addition, to minimize the level of impacts that might occur at USAKA as a result of the RV flight tests, specific monitoring activities and mitigation measures have been identified for implementation as part of the proposed MM III Modification. They include specific recovery and cleanup procedures for the removal of RV debris, air and soil monitoring for potential contaminants, minimizing disturbance of forest vegetation, the preservation and protection of sea turtle nesting habitat, and biological tissue sampling. These and other mitigation measures to be implemented are summarized in Section 4.7 of the EA. Additional measures for the protection of sea turtle nesting habitat at USAKA are included in the USFWS biological opinion provided in Appendix D of the EA.

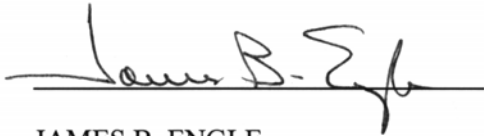
As part of the DEP process described earlier, the USAF will continue coordination and consultation with USAKA, the USFWS and NMFS Pacific Islands Regional Offices in Hawaii, the US Environmental Protection Agency (Region IX), and the RMIEPA, to clarify current mitigation measures and determine whether any additional mitigation measures are warranted. Biennial biological resource inventories at USAKA, which are conducted by USFWS and NMFS personnel, will also continue in accordance with the UES.

**Public Review and Comment:** An availability notice for public review of the Draft EA and Draft FONSI was published in local newspapers for each program support location on or before September 2, 2004, initiating a 30-day review period that ended on October 1, 2004. Because of an inadvertent failure of the *Kwajalein Hourglass* to publish the availability notice on schedule, the notice was published at a later date, and the residents of USAKA were provided an additional 15-day review period that ended on October 29, 2004. During review periods, copies of the Draft EA and Draft FONSI were made available in local libraries or offices in California, Colorado, Montana, Nebraska, North Dakota, Utah, Wyoming, and the RMI. The Draft EA and Draft FONSI also appeared on the Space and Missile Systems Center (SMC), Los Angeles AFB web site at <http://ax.losangeles.af.mil/axf>, listed under “announcements.” Comments received during the public review were addressed and incorporated in the Final EA.

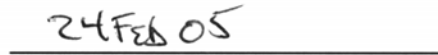
**Points of Contact:** The point of contact for questions, issues, and information relevant to the EA for MM III Modification is Dr. Ram Ramanujam, SERV Models and Environmental Engineer, ICBM System Program Office, Hill AFB, Utah. Dr. Ramanujam can be reached by calling (801) 777-2846, by facsimile at (801) 775-2587, or by e-mail at [Ram.Ramanujam@hill.af.mil](mailto:Ram.Ramanujam@hill.af.mil). The SMC point of contact for this EA is Mr. Thomas Huynh, SMC/AXFV, Los Angeles AFB, California. Mr. Huynh can be reached by calling (310) 363-1541, by facsimile at (310) 363-1503, or by e-mail at [Thomas.Huynh@losangeles.af.mil](mailto:Thomas.Huynh@losangeles.af.mil).

**Conclusion:** Based upon review of the facts and analyses contained in the EA, the USAF has concluded that implementation of the Proposed Action will not have a significant environmental impact, either by itself or cumulatively with other projects. Accordingly, the requirements of NEPA, the CEQ Regulations, 32 CFR Part 989, and UES are fulfilled and an Environmental Impact Statement is not required.

**Approved:**



JAMES B. ENGLE  
Deputy Assistant Secretary  
(Science, Technology and Engineering)  
Assistant Secretary of the Air Force for Acquisition



Date

**This page intentionally left blank.**